

# CHALLENGES AND OPPORTUNITES OF ADVANCED TECHNOLOGY RESEARCH IN VIETNAM ECONOMICAL DEVELOPMENT

## *THÁCH THỨC VÀ CƠ HỘI CỦA NGHIÊN CỨU CÔNG NGHỆ HIỆN ĐẠI TRONG PHÁT TRIỂN KINH TẾ VIỆT NAM*

TS Vu Phi Tran (*Dr. Vu Phi Tran*) phivuspkt@gmail.com

ThS Duy Tung Nguyen (*MSc Duy Tung Nguyen*) duytungnguyen3110@gmail.com

ThS Tuan Anh Nguyen (*MSc. Tuan Anh Nguyen*) ng.tuananh95@gmail.com

Ha Ngoc Minh Quan (*B.Acy. Ha Ngoc Minh Quan*) minhquanha95@gmail.com

Trường Đại học New South Wales at ADFA (*University of New South Wales at ADFA,  
Australia*)

Trường Đại học Canberra (*University of Canberra, Australia*)

### ***Abstract***

This paper presents opportunities and obstacles while Vietnamese researchers living in Australia employ state-of-the-art technology fields into the Vietnam market. Although the technology gaps and cultural differences between the two nations are massive in recent years, investment in science, technology, and innovation are required to achieve sustainable development goals and close the gaps between the "haves" and the "have nots". Moreover, the Vietnamese Government's support programs are essential to encourage investors to set up Vietnamese businesses.

### **Tóm tắt**

*Bản báo cáo này mong muốn nêu ra cơ hội và trở ngại của các nhà nghiên cứu người Việt Nam tại Úc trong quá trình vận dụng công nghệ tân tiến nhất của đa ngành vào thị trường Việt Nam. Do trong vài năm trở lại, sự cách biệt về công nghệ và đồng thời là sự khác biệt về văn hóa vẫn còn rất lớn, điều cần thiết để đạt được các mục tiêu phát triển bền vững và thu hẹp khoảng cách giữa những nước phát triển và đang phát triển. Hơn nữa, những chương trình hỗ trợ của chính phủ Việt Nam cũng sẽ góp phần khuyến khích các nhà đầu tư thành lập doanh nghiệp Việt Nam.*

***Keywords (Từ khóa): Vietnam market; challenges and opportunities; technology transfer; Australia investors.***

## ***1. Introduction***

### **1.1. Why does society need to develop science and technology?**

Today human beings are at the dawn of an unprecedented Technology Era. People referred to it as the Fourth Industrial Revolution. This historical moment inspires many companies, institutions, and the scientific community worldwide putting great efforts into the conduction of Science and Technology to gain competitive advantages. However, researchers sometimes find it thought-provoking to clear up potential challenges and opportunities when performing studies in such a field. Hence, in this article, our team would like to navigate them and provide an in-depth analysis of the Vietnamese market by applying Science and Technology research in Australia.

In particular, we would like to begin with a section on breaking down opportunities, and then critical challenges will also be given out throughout the rest of the paper. The next sections are outlined as follows: The opportunities for Vietnamese researcher in Australia in Section 1; the considered problems and the challenges that cause difficulty for the Vietnamese scientist are described in Section 2.

### **1.2. Opportunities for Vietnamese researcher in Australia**

The most significant opportunity facing Vietnamese researchers when conducting Science and Technology researches in Australia is the availability of similarities regarding the two economies in terms of development paths, suggesting an outcome that the results of such research papers in Australia could be much more suitable and valuable for Vietnam's future in the long run. In essence, the paper formulated by O'Cass and Ngo (2011) has pointed out that: economy-wise, there is plenty of examples and lessons that Vietnamese practitioners could learn from those of Australia, as the two nations possess a lot of common points, such as demographics movement and foreign direct investment attraction. Coupled with the real fact that Vietnam is also on a healthy track for Science and Technology, over the past few years, it is undeniable that research papers conducted in Australia could be able to accurately reflect Vietnam's expansion and growth in the next few years, thus providing beneficial conditions for researchers of the two nations to perform studies more effective in the future. For instance, Australia is one of world-leaders in drone technology and application, such as the agriculture industry. Apart from providing valuable plant and environmental data, some of the commercial UAVs are

equipped with the capability to fertilise your crops, eliminating the need for costly and time-intensive manual spraying or dusting. To evaluate the effectiveness of spraying pesticides on rice by autonomous drone, compared to traditional spraying (hand-spray). An experiment on a rice field (1 ha) was implemented in Bac Ninh (Vietnam), Winter-Spring crop in 2018, the result is:

Insecticide / spray method	Volume of pesticides to be used (liters / ha)	Volume of water to be used (liters / ha)	Spray time (minutes / ha)
Nixcher 100ME / Drone	0,98	20	15
Nixcher 100ME / Hand-spray	1,4	440	420

Source: <https://drone.jwclab.com/#mngmt>

Although the differences in using pesticides, water, and spray are significant (10%), as shown in the Table, giving Vietnamese farmers an affordable drone buying cost is challenging due to high import expenses. This issue sparks a need to study and manufacture drone systems made-in Vietnam based on technology transfer from the foreign partners, such as Australia.

The second opportunity is to strengthen relationships between the two nations across both the fields of politics and science research, which is grounded under the conduction of Science and Technology studies in Australia in Vietnam economic development. Essentially, it has been stated by Nguyen (2019) that: both Australia and Vietnam have been playing crucial roles in each other's growth and expansion across all sectors on the path of inter-state technological development and advancement. As a result, it could be argued that: Science and Technology research conducted in Australia could act as a strong supporting base for Vietnam to achieve an even more rapid economic development and growth in the future. In fact, the concept of cross-border knowledge transfer through the conduction of international research has been proven by Jandhyala and Phene (2015) to be a practical approach for states to acquire efficient expansion in terms of technological innovation and adoption in the future.

## **2. Challenges: Why do scientists find it challenging to develop and apply foreign science and technology to Vietnam?**

On the other hand, it cannot be denied that the conduction of Science and Technology research in Australia regarding Vietnam economic development will face many different challenges. The first apparent challenge is the high level of difficulty for potential future

research in Vietnam to be conducted that follow up in Australia. Notably, it has been argued by Prescott and Conger (1995) that: technological availability could influence science-oriented studies and papers, especially ones that require the involvement of modern innovations; such innovations are usually applied by practitioners in order to produce even more meaningful research outcomes that will be valuable for future studies of the same matter. In the case of Science and Technology researches conducted in Australia regarding a Vietnamese subject of interests, it can be seen that the massive difference in technological development between the two nations could negatively influence the tools and methods that researchers will use to perform Science and Technology studies over time. As a result, near-future papers within the same field in Vietnam would not be able to challenge the outcomes of those conducted in Australia, leading to the fact that knowledge gaps within the topic will still exist for a while.

The second biggest challenge facing Science and Technology research conducted in Australia about Vietnam economic development is the complicated level of distortion in research conclusions, resulting from several different factors. In essence, it has been pointed out by Nadler and Zemanek (2006) that: cultural factors stated within Hofstede's (2011) Cultural Dimensions framework could play a vital role in the influencing of a nation's economic development in the long run, simply due to the fact that certain social factors such as changes in demographics or cultural value perception could actually impact the nation's economic expansion across industries over time. In the case of Science and Technology researches based in Australia about Vietnam, it can be argued that unless the differences between Vietnamese and Australian cultures are properly addressed beforehand, such differences could widen the knowledge gap between the two nations' prospected economic development paths, thus degrading the validity and accuracy of the studies in the long run.

To sum up, through the detailed evaluation above, it can be argued that: there can be two main opportunities of Science and Technology research conducted in Australia in Vietnam economic development, which include: similarities between the two nations, the opportunity for stronger relationships; both of which could influence practitioners throughout the process. However, there are also two challenges: differences in sociocultural environments and gaps in technological development, both of which could negatively impact the research papers' conclusions over time. Therefore, it can be suggested that: researchers and practitioners within the field of Science and Technology

must be able to carefully evaluate each opportunity and challenges mentioned above during their conduction process so that they could be able to obtain the most desirable outputs in the end.

### **References (Danh mục tài liệu tham khảo)**

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. Online readings in psychology and culture, 2(1), 2307-0919.

Huong Nguyen, Q. (2018). Technology transfer and the promotion of technical skills from Japan to Southeast Asia: case study of Vietnam. Journal of ASEAN Studies, 6(2), 179-191.

Jandhyala, S., & Phene, A. (2015). The role of intergovernmental organizations in cross-border knowledge transfer and innovation. Administrative Science Quarterly, 60(4), 712-743.

Lee, J., Kim, T., Sung, M., Vu, H. H. T., Shin, K. N., & Ahn, J. W. (2020). An integrative approach to international technology transfer for recycling Vietnam coal ash with consideration of the technological, legal, and network perspectives.

Nadler, S., & Zemanek Jr, J. E. (2006). Cultural differences and economic development of 31 countries. Psychological reports, 99(1), 274-276.

Ngoc, T. H., Huy, N. Q., & Xuyen, N. H. (2020). Policy to Promote Technology Transfer: Experiences from China and Lessons for Vietnam. VNU Journal of Science: Policy and Management Studies, 36(4).

Nguyen, N. T. D., Takanashi, C., & Aoyama, A. (2012). Can efficient technology transfer be achieved through a hybrid corporate culture? A study on Japanese manufacturing subsidiaries in Vietnam. International Journal of Business and Management, 7(7), 24.

Nguyen, N. T. D., & Aoyama, A. (2015). The impact of cultural differences on technology transfer: Management practice moderation. Journal of Manufacturing Technology Management.

Nguyen, T. T. H. (2019). Examining Vietnam-Australia Political and Economic Relations. *Asian Affairs: An American Review*, 46(2-3), 63-79.

O'Cass, A., & Ngo, L. V. (2011). Winning through innovation and marketing: Lessons from Australia and Vietnam. *Industrial marketing management*, 40(8), 1319-1329.

Prescott, M. B., & Conger, S. A. (1995). Information technology innovations: a classification by IT locus of impact and research approach. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 26(2-3), 20-41.

## **Biography**

### **Vu Phi Tran**

Title: Dr. Field: Aerospace Engineering, University of New South Wales at ADFA

Email: [phivuspkt@gmail.com](mailto:phivuspkt@gmail.com) / Mobile: 0434011191

### **Duy Tung Nguyen**

Title Master of Science, University of New South Wales Canberra at ADFA

Current Occupation: PhD Student, Computer Scientist

Email: [duytungnguyen3110@gmail.com](mailto:duytungnguyen3110@gmail.com) / Mobile: 0412334642

### **Tuan Anh Nguyen**

Title: Master of Business Informatics, University of Canberra

Email: [ng.tuananh95@gmail.com](mailto:ng.tuananh95@gmail.com) / Mobile: 0444577769

### **Ha Ngoc Minh Quan**

Title: Bachelor of Accounting, University of Canberra

Email: [minhquanha95@gmail.com](mailto:minhquanha95@gmail.com) / Mobile: 0432323409